

## CLAIMS

### Claim 1

- 5 A remote control device with displays and ball switches, comprising:
- a. a case 2;
  - b. a display section 3 situated at upper section of the front face of said case 2;
  - c. a machine selection wheel switch section 6 which is situated at inside of said case 2 and some parts of the section are exposed through the front face and contains a first  
10 wheel operation section 4, a first click encoder 5 and a first push sensor 4a;
  - d. a menu function selection ball switch section 9 which contains a second wheel operation section 41, a second click encoder 8 and a second push sensor 7a;
  - e. a function selection ball switch section 11 which is situated at inside of said case 2 and some parts of the section are exposed through the front face;
  - 15 f. a CPU 12 which inputs, outputs and controls the electric signals generated by rotation of said machine selection wheel switch section 6, menu selection wheel switch section 9 and function selection ball switch section 11;
  - g. a signal transmitting section 15 which has an infrared ray photoemission diode 14 in connection with output and a memory 13 which has built in machine, menu and  
20 function selection program; and
  - h. a click sound generation section 17 with a speaker 16.

### Claim 2

- 25 The remote control device as claimed in Claim 1, wherein said function selection ball switch section 11 further comprising:
- a. a fixed plate 28 having axis holes 29, 29a and first to fourth fixtures 30-33 with an insertion groove 29b at the center which are located in the diagonal direction ;
  - b. a selection means 34 which has the functions of a stopper, acceleration and selection  
30 is located between the first & second fixtures 30, 31 and the third & fourth fixture 32, 33;
  - c. a ball 35 is located at the upper center of the selection means 34 and fixed plate 28;
  - d. a third push sensor 41a located at the upper face of the fixed plate 28 under the free end of the support plate 44.
  - 35 e. a detecting section 38 at one side of said first and fourth fixture 30-33 which has the function of a switch and also comprises the third to sixth click encoders 34-37;

- f. an operation section 41 which has a plurality of wheels 39, 40 and is located at a location having a small separation clearance L from the center of the rotational axis 38 and at the same time, makes the end section of the rotational axis 38 which is inserted to the axis holes 29, 29a of said first to fourth fixtures 30-33 to be inserted to said third to sixth click encoders 34-37; and
- g. a ball guide which has the first to fourth roller 50-53 on upper face an elastic square plate 54 and is inserted to the insertion groove 29b at the lower end of plate 54.

### Claim 3

- The remote control device as claimed in Claim 2, wherein said selection means 34 further comprising:
- a. a hinge section 42 which has a hinge hole 41 between the first and second fixtures 30, 31;
- b. a support plate 44 in the shape of "v" which allows the rotational movement using the rotational axis 43 at the hinge hole 41;
- c. a stopper 48 in the form of housing which contains a spring 45 and supporting ball 46 at the center of the support plate 44; and
- d. a third push sensor 49 located at the upper face of the fixed plate 28 under the free end of the support plate 44.

### Claim 4

- The remote control device as claimed in Claim 1, wherein said display section 3 further comprising:
- a. a first display area 20 which displays program name and machine name;
- b. a second display area 23 which displays a program list and a menu;
- c. a third display area 24 which displays the function of said function selection ball switch section 11; and
- d. a fourth display area 25 which displays the condition of the operating remote control device.

### Claim 5

- The remote control device as claimed in Claim 4, wherein said machine name 19 and program name 18 in said first display area 20 can be scrolled up/down according to the

rotation direction of said machine selection wheel switch section 6 and, a matching number of arrows corresponding to the number of hidden machine name 19 and program name 18 are displayed at the top and bottom end of the display and, the selected part in the middle is indicated by a shaded block and the menu list of selected machines and programs are displayed in the second display area 23.

#### **Claim 6**

The remote control device as claimed in Claim 4, wherein the menu name in said second display area 23 can be scrolled up/down according to the rotation direction of the menu selection wheel switch section 9 and, a matching number of arrows corresponding to the number of hidden menu name is displayed at the top and bottom end of the display and, the function of the function selection ball switch section 11 with respect to the selected menu is displayed in third display area 24 at the same time.

#### **Claim 7**

The remote control device as claimed in Claim 4, wherein said third display area 24 can be switched on/off according to the rotation direction of the function selection ball switch section 11 and the menu advances 10 steps by one click.

#### **Claim 8**

The remote control device as claimed in Claim 4, wherein the program name in front of said first display area 20 has a star mark indication on order to distinguish with other machine names.

#### **Claim 9**

The remote control device as claimed in Claim 4, wherein in connection with said first display area 20, either menu or program of the selected machine is displayed in the second display area 23.

### **Claim 10**

The remote control device as claimed in Claim 4, wherein in connection with said second display area 23, the function of said function selection ball switch section 11 of  
5 the selected menu is displayed in third display area 24.